

Ionisation equations

1) Methanoic acid, HCOOH , is a weak acid. A dilute aqueous solution of this acid has a pH of 2.78.

$$\text{p}K_{\text{a}}(\text{HCOOH}) = 3.74$$

Write an equation for the reaction of methanoic acid with water.

2) An aqueous solution of ammonium chloride (NH_4Cl) has a pH of 4.66.

i) Write the equation for solid ammonium chloride **dissolving** in water.

ii) Write the equation for the ammonium ion reacting with water.

3) Ethanoic acid, CH_3COOH , is a common organic acid.

$$\text{p}K_{\text{a}}(\text{CH}_3\text{COOH}) = 4.76$$

$$K_{\text{a}} = 1.74 \times 10^{-5}$$

i) Write an equation for the reaction of ethanoic acid with water.

ii) Write the K_{a} expression for ethanoic acid.

4) When bromine is added to water, it forms hypobromous acid (HOBr), a weak acid.

Write an equation to show the equilibrium system that is formed with hypobromous acid and water.

5) For the following 0.1 mol L^{-1} solutions, write an equation to show the reaction with water.

i) CH_3NH_2

ii) NH_4Cl